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Physiological response of *Parthenium hysterophorus* to defoliation by the leaf-feeding beetle *Zygogramma bicolorata*

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## Abstract

The annual shrub, *Parthenium hysterophorus* L. (Asteraceae), is a severe noxious weed of global significance, having been the target of control programmes in several affected countries. Biological control efforts in South Africa have seen a total of four agents released to date, one of the most promising of which is the leaf-feeding beetle, *Zygogramma bicolorata* Pallister (Coleoptera: Chrysomelidae), first released in 2013. Detailed study of the ecophysiological interactions of insect herbivores and their target weeds are under-represented in the biological control literature. Extensive leaf-feeding by *Z. bicolorata* adults metabolically impaired *P. hysterophorus* leaves, resulting in a ~36% reduction to photosynthesis in remaining leaf tissue. However, in response to *Z. bicolorata* herbivory,

BWC, LWS, JMG, MJB, ETFW and NV conceived and designed the experiments. BWC and NV performed the experiments. BWC, LWS, JMG, MJB, ETFW and NV analysed the data. LWS, JMG, NV, MJB and ETFW provided critical input into data and statistical analyses. BWC wrote the manuscript.

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